

THE HEALTH OFFICER'S EXCHANGE

Under this head the Journal will print short articles giving accounts of actual experiences, methods and plans which have proved of practical utility in local health organizations, in the hope that health officers and sanitarians generally will find them of interest and value. Health officers and other health workers are invited to submit their experiences. Manuscripts must be limited to 1,500 words, preferably 1,000. The briefer and more concisely written they are, the better the chance of their publication.

SKETCH MAPPING FOR PUBLIC HEALTH PROBLEMS

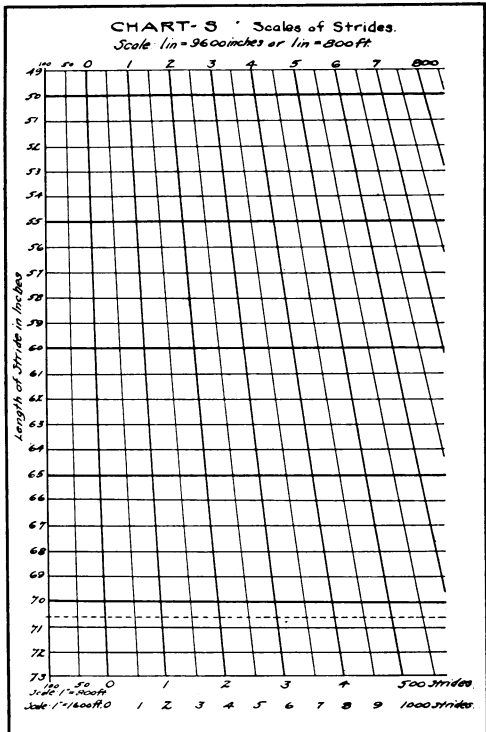
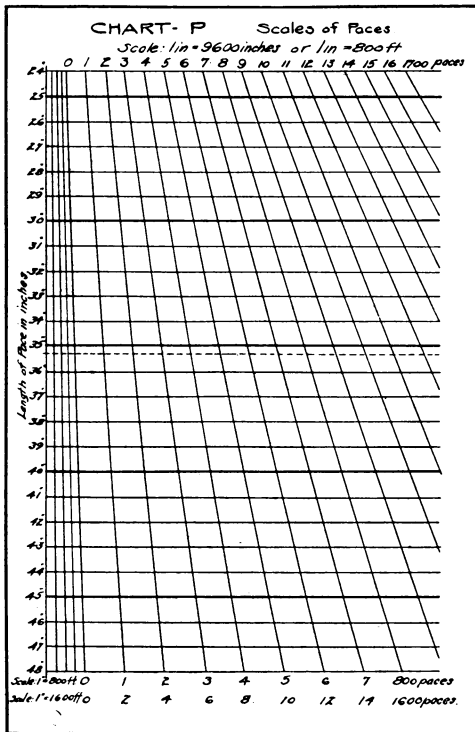
The public-health officer of today recognizes the necessity of having good maps of the territory under his consideration. Especially is this true in yellow fever, malaria and hook-worm studies. It has been found, however, that it is not always possible to obtain reliable maps of all territories, especially in most foreign countries. Therefore it is quite necessary that the public-health officer, whether a physician or otherwise, should know the principles of sketch mapping in order to construct maps sufficiently accurate in scale and represented data to be of use in his work. It is the purpose of this paper to present the subject of sketch mapping in the simplest form possible, following closely the methods employed in the military service of the United States.

In preparing sketch maps of this nature no measuring instruments are necessary other than one's pace or stride, therefore, the pace or stride of the individual must be accurately determined as the basic unit of measure. A pace is the distance from the heel of one foot to the heel of the other foot in walking naturally. A stride is the distance from the heel of one foot to the heel of the same foot as it strikes the ground the second time or, in other words, a stride is equal to two paces. In order to measure one's pace or stride it will be necessary to lay off on the ground an accurately measured distance of say 500 yards, double this distance would be better. This distance should then be paced off at least four times, noting the number of paces each time. The average of these trials will give a fairly accurate result. For example, if the average were 510 paces for a distance of 500 yards, this would make 35.3 inches, the actual length of one pace. A stride would be twice this or 70.6 inches.

Without going into the mathematics of converting this pace or stride into the scale desired on the map as inches to miles or inches to feet, charts P and S may be consulted and the corresponding scale to the figured length of pace or stride is that to be used in plotting the map in the field.

The ordinary scales adopted for use in the military service are 3 inches, 6 inches, or 12 inches to 1 mile. However, by using these scales in uneven feet it will be found more difficult to reproduce enlargements of the field sketch when the case arises. In the engineering profession the ordinary scales used for towns and cities are 1 inch to 1,000 feet, 800 feet, 400 feet or 200 feet. It will be noticed that these scales are multiples of 2 and, therefore, for purposes of enlargement can be easily handled. Hence the scales here chosen for the field or flat sketch maps are 1 inch to 1,600 feet and 1 inch to 800 feet. On the basis of these two scales Charts P and S have been plotted to give the corresponding scales of paces or strides for any length pace or stride.

In case a field sketch is made on the scale of 1 inch to 800 feet or 1 inch to 96,000 inches (i. e., 1 inch on the map equals 96,000 inches on the ground) it would be found to be too small for detail, spotting of houses or other similar features, but since this sketch is made on cross section paper it can easily be enlarged by the coördinate method to twice, four times and eight times its size, as the case may be, to reproduce a sufficiently large map. In Fig. 1 is shown the method of enlargement by the coördinate method. The original field sketch is on the scale of 1 inch to 800 feet plotted on cross section paper, it is desired to enlarge this sketch to twice its size, or to the scale of 1 inch



to 400 feet. This is easily done by doubling the coördinates as represented in the figure.

MATERIALS NECESSARY FOR MAP SKETCHING

The Board: A perfectly smooth soft pine board, preferably 14 inches by 13 inches with absolutely squared edges is necessary, to which must be attached a small compass needle. A small watch compass is excellent for this purpose and may be affixed to the board by cutting a hole the size of the compass in order to hold it in a fixed position at all times. Place the compass in such a position as to have the north and south line parallel to one edge of the board. (See Fig. 2.)

The Alidade: The alidade is simply a small triangular piece of hard wood weighted with lead inserted in a small hole in the end to give it weight. It should be about 6 to 8 inches in length and have smooth surfaces on which to mark the various scales. This triangular scale or alidade is used as a sighting instrument and rests on top of the board (See Figs. 2 and 3).

Paper, Pencil and Thumbtacks: Any good grade cross section or profile paper may be used, preferably ruled in one inch squares and divided into tenths. A pencil of hardness 4H is the best for field use. Thumbtacks are necessary to hold the paper in place on the board.

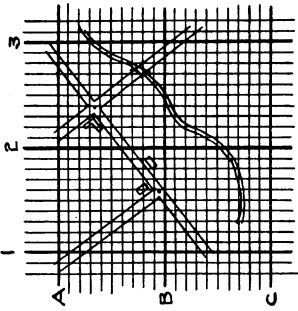
PREPARING THE SCALE FOR USE ON THE ALIDADE

As stated above, the length of the pace determined was 35.3 inches. Therefore, placing the alidade along the line on the Chart P corresponding to 35.3 inches, transfer the divisions of this line to one edge of the alidade. (In this case see the dotted line on Chart P.) This scale then will represent a scale in paces equal to 35.3 inches to correspond to the map scale of 1 inch to 800 feet. If the stride scale is preferred, and it is believed the scale of strides will be found more convenient, the dotted line on Chart S can be used, which is 70.6 inches as figured above. On the other edge of the alidade, directly opposite this pace or stride scale, lay off another scale in inches, this latter to be used in reading and scaling the map in the office.

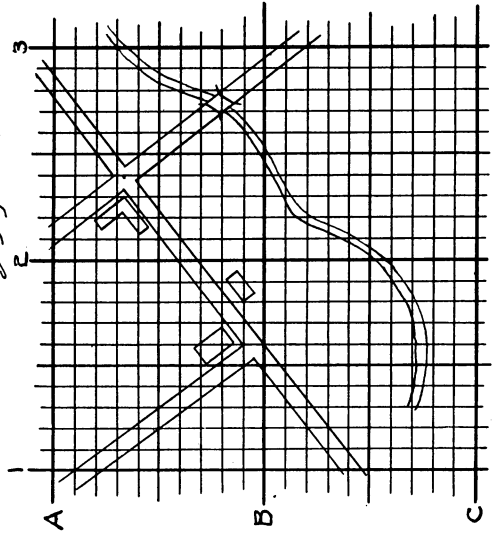
METHOD OF SKETCHING THE MAP IN THE FIELD (FLAT SKETCH)

Assuming the sketching board is prepared with cross section paper and compass, select a suitable point from which to start the sketch, preferably at the intersection of two streets on the extreme edge of the area to be mapped. With this as a starting point hold the board in such a position as to have one edge in a line parallel to the north and south line as shown

Fig. 1
Field Sketch of town on Cross Section Paper.
Scale: 1 in = 800 ft.



Method of Enlarging by Coordinates.



Field Sketch same as above enlarged to two times
Scale: 1 in = 400 ft.

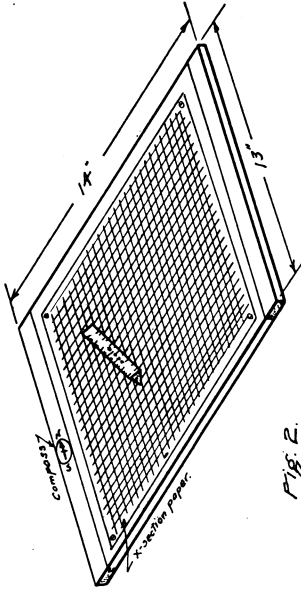


Fig. 2.
Sketching board with Compass attached
and paper in position.

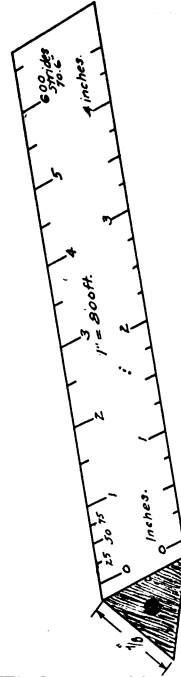
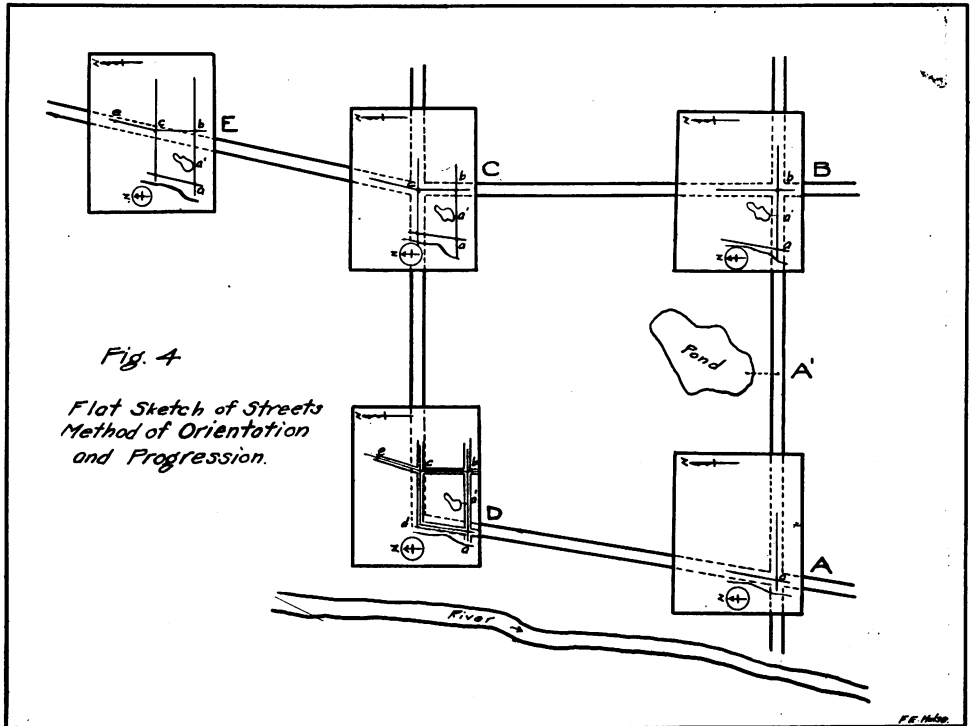


Fig. 3
Combination Triangular Scale and Alidade

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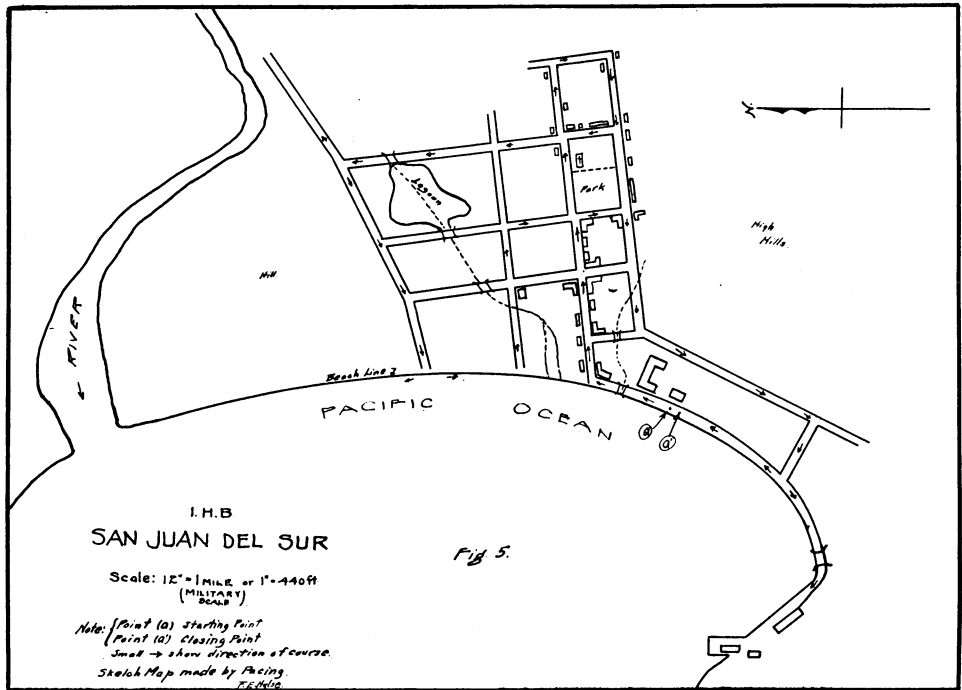


by the compass needle. Now draw a line on the edge of the map in the north and south direction marking the north end N. In all future positions when taking sights and readings be sure that the board always points in the same direction, namely, north and south, parallel to the compass needle. This placing the board in the N and S line at each new position is known as orientation.

Figure 4 represents a portion of a town which it is desired to map, and shows intersecting streets A, B, C, D and E. Since point A is on the extreme edge of the town, assume this as a starting point. Holding the board in the hands take position at A, orient the board until the N and S line on the map points north as indicated by the compass needle, the mark (a) on the map. Now (a) on the map corresponds to A on the ground. Facing in the direction of B, place the alidade with one edge along point (a) on the sketch and sight along the top edge to B, drawing a line in the direction of B indefinite in length. Without changing the position of the board, do the same for point D. Now from point A on the ground pace off the distance to B and with the pace scale on the alidade plot this distance on the sketch. Now with point (b) on the board over

B on the ground, orient the board and sight to point C and in all other directions if at a street intersection, drawing the lines of directions on the sketch. After pacing to C and plotting the distance on the sketch, orient at C and repeat for points D and E. In this manner the sketch progresses from point to point, with the board always in the same position with respect to the N and S line. The distance from point D to point A is the closing line and acts as a check on the accuracy of the sketch. At the same time that these distances are being paced off all important features along the streets may be noted by plotting the number of paces along the line and sighting at right angles to the line, recording the distance in paces to the object. For example: In Fig. 4 midway between points A and B is a pond, point A'. In pacing from A to B when opposite this pond at point A', plot the number of paces on the sketch, orient the board and sight to the pond, pace and plot as before. In this manner houses and other important features may be plotted on the sketch as it progresses.

Fig. 5 is a sketch map made in this manner, the starting point being at point (a) and the closing point at (a') the direction of the course



taken being represented by the small arrows in the streets. The closing distance or difference is very small, considering the errors that might be present in inaccurate pacing, etc.

It is to be noted that sketch maps of this nature are plotted in the position of north and south as given by the compass needle which is not the true north, the north of the compass being known as the magnetic north. Therefore, this should be noted on the map.

The above is the method of preparing flat sketch maps without regard to differences in elevation and other topographical features. Contours or imaginary lines of constant elevation are not necessary in the ordinary spot maps used in public-health work, except in the

case of malaria studies where the differences in elevation are vitally important for the purpose of determining drainage courses. Such maps for malaria control should, therefore, be prepared by an engineer with accurate instruments. For those who have the desire to acquaint themselves with the methods of plotting contours it is suggested that they obtain the little book published by the United States Infantry Association: *Military Sketching and Map Reading* by Grieves. The above publication was used as a reference in preparing this paper.

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PSYCHOLOGY IN RURAL PUBLIC HEALTH WORK

Men without scientific training usually do not properly comprehend the principles upon which scientific knowledge is based and are inclined to regard opinions founded upon such knowledge as mere individual opinions or deductions as a result of personal observations. In consequence they regard themselves equally competent to express opinions upon scientific subjects as those who are qualified by knowledge and training in their special lines of activity. If, how-

ever, you can enter into an intelligent discussion of subjects with which they are familiar, you will be able to gain their confidence and respect for the opinions which you desire to give them. The following is an illustration:

At one time I arranged for a meeting of a board of health in a remote rural community. The board was composed entirely of farmers who from their environment had had little opportunity of mingling with people